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10/698,044	10/30/2003	Yiqing Liang		1168

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Vienna, VA 22182

EXAMINER

AZARIAN, SEYED H

ART UNIT PAPER NUMBER

2625

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,044

Applicant(s)

YIQING LIANG

Examiner

Seyed Azarian

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 14-17 and 19-55 is/are rejected.
- 7) ☒ Claim(s) 11, 13 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321[©] may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-55, rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31, of U.S. Patent No. 6,678,413. Each of the limitation set forth in the claims of the instant application is defined in the claims of the patent.

As an example consider claims 1 and 2 of current application, compared to claim 1, of U.S. Patent No. 6,678,413 discloses; a system, comprising a computer configured to determine a position and shape of an object of interest from video images and characterize activity of said object of interest based on analysis of changes in said position and said shape over time (column 24, lines 58-64);

wherein said computer includes an object identification and segregation module receiving said video images (column 24, lines 65-67);

also consider claim 19 of current application, compared to claim 26, of U.S. Patent No. 6,662,166 discloses wherein the said step of determining actual behavior by aggregating behavior primitives includes the step of analyzing temporal ordering of this primitives, such as using information about a transition from a previous behavior primitive (column 27, lines 13-19), and finally claim 20 of current application, compared to claim 27, of U.S. Patent No. 6,662,166 discloses wherein the said temporal analysis is a time-series analysis such as Hidden Markov Model (HMMs)).

The other claims have similar correspondence to the patent application

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-10, 12, 14, 17, 19 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Maki et al (U.S.6, 072,903).

Regarding claim 1, Maki et al discloses a video-based animal behavior analysis system, comprising, a computer configured to determine a position and shape of an animal from video images and characterize activity of said animal based on analysis of changes in said position and said shape over time (see column 15, lines 49-57, detecting information about position, shape

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and posture of object, also column 32, lines 56-67, to target object and configured to determine pixels corresponding, and position and posture of target, and column 24, line 63 through column 25, line 11, described the motion of the object automatically or acquire information on the “position of the object or on the change of the posture”, on the basis of the time-series images, and posture information detector 303, tracks the motion of the object automatically according to the position of the feature points).

Regarding claim 2, Maki et al discloses the system of claim 1, further comprising: a video camera and a video digitization unit coupled to said computer for capturing said video images and converting said video images from analog to digital format (see column 23, line 64 through column 24, line 7, tracking of motion picture, by use of television camera, also column 8, lines 46-51, refer to using a digital filter).

Regarding claim 3, Maki et al discloses the system of claim 2, further comprising, an animal identification, segregation, and tracking module receiving said video images (column 29, lines 23-28, receiving three-dimensional position information).

Regarding claim 4, Maki et al discloses the system of claim 3, wherein said computer further includes a behavior identification module for characterizing activity of said animal, said behavior identification module being coupled to said animal identification, segregation, and tracking module (see claim 3, also column 23, lines 37-51, the three-dimensional position and posture of the target object at each point).

Regarding claim 5, Maki et al discloses the system of claim 4, wherein said computer further includes a standard animal behavior storage module that stores information about known behavior of a predetermined standard animal for comparing the activity of said animal, said

standard animal behavior storage module being coupled to said behavior identification module (see claim 4, also column 7, lines 19-33, memory for storing time-series images).

Regarding claim 6, Maki et al discloses the system of claim 1, wherein said animal is a mouse (column 2, lines 20-26 refer to three dimensional mouse).

Regarding claim 8, Maki et al discloses a method of determining and characterizing activity of an animal using computer processing of video images (column 23, lines 30-36, computer graphic);

comprising the steps of, detecting an animal in said video images; tracking changes to said animal over a plurality of said video images (see claim 1, also column 23, line 64 throw column 24, line 7, tracking of motion picture);

identifying and classifying said changes to said animal; and characterizing said activity of said animal based on comparison to pre-trained models or rules of such activity (see column 3, lines 15-22, changes of image in different time, and also column 27, lines 20-31, comparison and synthesizing the images).

Regarding claim 9, Maki et al discloses the method of claim 8, wherein said step of characterizing said activity includes the steps of: describing a sequence of postures as behavior primitives; and aggregating behavior primitives into actual behavior over a range of images (see claim 1, column 22, lines 56 through column 23, line 7, estimation range of distance using three-dimensional position).

Regarding claim 10, Maki et al discloses the method of claim 9, wherein said step of characterizing said activity by describing and aggregating behavior primitives further includes the steps of, describing a set of conditions and rules required for characterizing said activities,

and matching and testing generated features to see if said conditions and rules are satisfied (column 4, lines 18-37, matching and estimates the distance information on the basis of the evaluation).

Regarding claim 12, Maki et al discloses the method of claim 10, wherein said posture determination and description includes using statistical and contour-based shape information (column 9, lines 14-27, determining points of contours).

Regarding claim 14, Maki et al discloses the method of claim 12, wherein said step of identifying and classifying changes to said animal uses contour-based shape information selected from the group consisting of curvature measures, thickness measures, relative orientation measures, length measures, and corner points (column 9, lines 14-23, refer to connected feature points, such as outer corner of the eye).

Regarding claim 17, Maki et al discloses the method of claim 10, wherein the said step of describing said behavior primitives includes the step of identifying patterns of postures over a sequence of images (column 3, line 63 through column 4, line 17, change of the position and posture of the target in the time series images).

Regarding claim 19, Maki et al discloses the method of claim 10, wherein the said step of determining actual behavior by aggregating behavior primitives includes the step of analyzing temporal ordering of the primitives, such as using information about a transition from a previous behavior primitive to a next behavior primitive, and applying all applicable conditions and rules (column 8, lines 9-25, previous and current images).

Regarding claim 21, Maki et al discloses the method of claim 19, wherein the said step of determining actual behavior includes identifying actual behavior selected from a group of pre-trained behavior models (Fig. 18, column 7, lines 10-25, model of moving object).

Regarding claim 7, recite similar limitation as claim 6 is similarly analyzed.

Claim Rejections - 35 U.S.C. § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-16 and 22-55, are rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Shuster et al (U.S.6, 242,456).

Regarding claim 15, Maki et al does not explicitly state, "identifying a set of model postures and their description information such as eating posture, or drinking posture". On the other hand Shuster teaches, displaying various types of behaviors in animal, such as scratching, licking, drinking, eating, drooling, grooming, tail chasing and head shaking (column 3, lines 33-62).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki et al invention according to the teachings of Shuster

because it provides a method for detecting and treating compulsive behaviors in animals which can easily be implemented in an images device such as digital still or video camera.

Regarding claim 16, Maki et al discloses the method of claim 15, wherein said step of identifying and classifying changes to said animal includes classifying the statistical and contour-based shape information from a current image to assign a best-matched posture (see claim 14, also column 4, lines 19-35, degree of matching).

Regarding claim 28, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of jumping, and said jumping behavior is determined by a single up and down movement of the animal (column 2, lines 46-52, model of a moving object).

Regarding claim 33, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of sleeping, and said sleeping behavior is determined by the absence of major movements of the contour of the animal for a prolonged period of time (column 9, lines 14-26, the upper and lower contour).

Regarding claim 39, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of turning, and said turn behavior is determined by a sequence of postures starting from horizontal side view or cuddled posture to ending in a horizontal front/back view posture, and vice versa (column 25, lines 6-11 posture information).

Regarding claim 48, Maki et al discloses the method of claim 8, wherein said step of detecting animal includes the step of detecting body parts of the animal (column 15, lines 49-63, detect information on the distance to the object and shape according to the position and posture).

With regard to claims 22-27 and 29-32, the arguments analogous to those presented for claim 15, is applicable.

Regarding claims 34-38 and 40-47 and 49-55, recite similar limitation as claim 15 are similarly analyzed.

5. Claim 20, is rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Smith et al (U.S.5, 870,138).

Regarding claim 20 Maki fails to disclose "Hidden Markov Model (HMMs). On the other hand Smith et al teaches, neural network or Hidden Markov Model and has two phases of operation, namely training and recall to map the input images from camera to outputs which represents the probability of the input images (column 17, lines 41-55).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki et al invention according to the teachings of Smith et al because it provides signal processing techniques to map the input data (images) from the camera to outputs which represents the probability of the input images belonging to a specified set of expressions, that can easily be implements in an images device for better result and greater accuracy such video surveillance or monitoring system.

Allowable Subject Matter

6. Claims 11, 13 and 18, are objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Other prior art cited

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent (6,715,444) to Yabusaki et al is cited for method and device for measuring frequency of specific behavior of animal.

U.S. patent (6,630,347) to Huang et al is cited for endothelial nos transgenic animal and method of use.

U.S. patent (6,630,148) to Ingham et al is cited for compositions comprising hedgehog proteins.

U.S. patent (6,576,237) to Ingham et al is cited for vertebrate tissue pattern-inducing proteins and uses related thereto.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (703) 306-5907. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner

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October 24, 2004

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A handwritten signature in black ink, appearing to read 'Bhavesh M. Mehta', written in a cursive style.

**BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600**